

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in view of the above amendments and in light of the following discussion, is respectfully requested.

Claims 2-13, 17-19, and 21 are pending. In the present amendment, Claims 17 and 19 are currently amended. Support for the present amendment can be found in the original specification, for example, at page 1, lines 5-10. Thus, it is respectfully submitted that no new matter is added.

In the outstanding Office Action, Claims 1, 2, 4-6, 9, 10, 13, 17, and 19 were rejected under 35 U.S.C. § 103(a) as unpatentable over Miyazawa et al. (U.S. Patent No. 5,653,357, hereinafter “Miyazawa”) in view of Adey et al. (U.S. Patent No. 6,205,831, hereinafter “Adey”); Claim 7 was rejected under 35 U.S.C. §103(a) as unpatentable over Miyazawa in view of Adey, and further in view of Shimizu et al. (U.S. Patent No. 5,686,194, hereinafter “Shimizu”); Claims 18, 19, and 21 were rejected under 35 U.S.C. §103(a) as unpatentable over Miyazawa in view of Adey, and further in view of Ueno et al. (U.S. Patent No. 4,143,790, hereinafter “Ueno”); and Claim 18 was rejected under 35 U.S.C. §103(a) as unpatentable over Miyazawa in view of Adey and Ueno, and further in view of Rashid et al. (U.S. Patent No. 6,253,588, hereinafter “Rashid”).

In response to the rejections under 35 U.S.C. § 103(a), Applicant respectfully requests reconsideration of these rejections and traverses these rejections, as discussed below.

The claimed method deals with the control of the drawing at industrial scale of metallic sheets having a thickness below 0.65 mm. Claim 17 is hereby amended to clarify that the drawing of these metallic sheets is for fabricating a composite laminate *automotive* part.

As described for example in lines 1-37 of page 2 of the original specification, at such thicknesses steels used for automotive parts do not have capacity to deform sufficiently in

order to compensate for the variations in clearance between tools that appear during the drawing. In shrinkage areas, i.e. where the sheet tends to get thicker during the drawing, folds will occur. This default can be limited by diminishing the value of the positive clearance. Nevertheless, this creates areas where the sheet will be pinched. Due to the mechanical properties of steels for automotive parts, tears/fractures will thus occur in these areas.

It is possible to minimize these defaults on one sheet by carefully adjusting the value of the positive clearance but the process window is very narrow in this case. However, as the sheets that are successively drawn in a specific tool slightly differ in their thickness and mechanical properties, the right positive clearance for one specific sheet is not the right positive clearance for the next one. Thus, a lot of drawn sheets are rejected. Moreover, each time a tool is changed or maintenance is required, the difficult adjustments have to be done once again. This situation is not industrially viable. Accordingly, it was necessary to find a drawing process of thin metallic sheets more tolerant to these three domains of dispersion (i.e., the thickness variations, the mechanical properties variations, and the tool variations).

The solution developed by the inventor of the claimed method comprises:

- Firstly, opening the process window by selecting a clearance much higher than the thickness of the steel sheet, and
- Secondly, finding the right means to maintain the sheet into the tool during drawing.

The means in question consist in adding a polymeric film on the metallic sheet to be drawn. The polymer, which is squeezed thanks to a negative clearance, serves to maintain a constant and uniform pressure and contact between the punch, the sheet, and the die. The polymer compensates, instead of the sheet, the clearance variations between tools and facilitates the flowing of the product in the tool by flowing sacrificially (see p. 10, ll. 19-22 of the original specification), i.e. the polymer is compressed and deformed in place of the

metallic sheet. The formation of folds in the part, the deterioration of the precoat (zinc layer) and/or the breakage of the part are thus eliminated (see p. 10, ll. 4-7 and p. 16, ll. 5-8).

The cited references, either alone or in any combination thereof, do not render obvious the claimed method.

Regarding the combination of Miyazawa and Adey, Applicant first respectfully submits that one of ordinary skill in the art would not have considered Miyazawa as a proper primary reference since Miyazawa does not deal at all with the problems discussed about regarding production of automotive parts. Instead, the selection of Miyazawa as closest prior art is already the sign of an *ex post facto* analysis. As Miyazawa describes a laminated draw-formed container having excellent flavor-retentivity and shock resistance, one of ordinary skill in the art reading Miyazawa, in front of the problems to be solved, would not have had any idea that the solution regarding production of automotive parts would consist in adding a polymeric film.

Moreover, contrary to the position taken in the Office Action, the drawing method described in Miyazawa differs significantly from the claimed method. The laminate of Miyazawa is draw-formed by means that have been known *per se*, for example a deep-draw-forming (draw-redraw-forming) (see col. 9, l. 66 to col. 10, l. 1). The thickness of the side wall can be further reduced by bend-elongation (see col. 10, ll. 19-20) or ironing (see col. 9, l. 28). In this case, the thickness of the side wall of the can should be reduced to 5 to 45% and, particularly, 5 to 40% of the blank thickness (see col. 10, ll. 30-32). It also appears that all the examples in Miyazawa describe cups subjected to primary and secondary thickness-reducing redraw-formings (see col. 12, ll. 11-12 for example 1; col. 12, ll. 51-52 for example 2; and col. 13, ll. 2-3 for example 3). Such deep-draw-formed cups exhibit a change in the thickness of the side wall of -20% with respect to the blank thickness (see col. 12, ll. 23-24).

On the contrary, the claimed method refers to a draw-forming process used in the *automotive* industry where the thickness-reduction of the side-walls is *not desired*. This is clear from the description of the drawing test (see p. 13, ll. 30-34). This is also evidenced from the description of the steel grades that are typically used in the automotive industry: Dual Phase grades (DP500, see p. 13, l. 15), grades ES, grades HLE or grades IF P220 or P235 (see p. 6, ll. 14-16). These steel grades *absolutely do not* withstand bend-elongation, ironing. Thus, one of ordinary skill in the art of forming automotive parts had absolutely no reason to consider Miyazawa.

Further, even if Miyazawa had been considered, there was no suggestion or teaching in the prior art that would have lead to its combination with Adey.

As previously stated, Miyazawa is silent as to adjusting the value of the material passage so that the clearance is negative.

The effect of such a feature of the claimed method is to compress the polymer so that the polymer will flow sacrificially in the tool. Miyazawa does not look at all for this effect. On the contrary, one of the objects of Miyazawa is to *avoid the damages* done by tools on the organic film during the draw-forming step (see col. 2, ll. 21-26). Thus, Miyazawa teaches away from the claimed negative clearance. It is clear that one of ordinary skill in the art reading Miyazawa would not have considered selecting a negative clearance as it would have unavoidably increased the damages of the organic film.

Moreover, Adey describes the drawing of metal strips that are *not covered* with a polymer (see col. 14, ll. 10-25). Accordingly, a person of ordinary skill in the art would not have had any reason to consider Adey to select the negative clearance so that the polymer would flow sacrificially. On the contrary, it is clear from Adey that the negative clearance leads to the *thinning* of the metal strip (see col. 11, ll. 21-25). As stated above, the thinning of the metal strip is *precisely what the claimed method is trying to avoid*.

Moreover, Adey describes the necessity to highly polish the side walls of the die so as to impart a desirable finish to the side wall of the drawn part (see col. 11, ll. 61-64). It is thus clear that the surface of the drawn part highly rubs against the tools. The use of a metal sheet coated with a metal coating such as zinc alloy in the process of Adey would thus inevitably leads to the tearing of the metal coating. Again, this is *precisely what the claimed method is trying to avoid*.

For at least these reasons, a person of ordinary skill in the art of fabricating automotive parts would not have found it obvious to combine Adey with Miyazawa as proposed in the Office Action.

Further, Applicant respectfully submits that none of the remaining secondary references cure the deficiencies of the combination of Miyazawa and Adey. Therefore, it is respectfully requested that the rejections under 35 U.S.C. § 103(a) be withdrawn.

In section 8 on page 7, the Office Action cites U.S. Patent No. 4,644,626 to Barnes et al. (hereinafter “Barnes”) for the first time as being “pertinent to applicant’s disclosure.” Although Barnes is not relied upon to reject the claims, Applicant provides the following discussion regarding Barnes to advance prosecution.

Barnes discloses a method of producing metal articles of precisely controlled shape and thickness even when the thickness of the article is small and the degree of deformation required on forming varies widely between different parts of the article (see col. 1, ll. 31-36). Under the defined conditions, the blank is deformed in such a way that wrinkles and local thinning are avoided (see col. 2, ll. 12-13).

Claim 17 differs from the disclosure of Barnes at least in that:

- the claimed part is a composite laminate part;
- at least one side of a steel sheet is coated with one or more adhesive polymer films of which the total thickness  $E_p$  is equal to or greater than 0.1 mm;

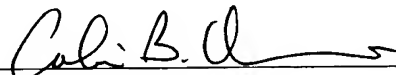
- the drawing is carried out in a drawing tool comprising a die; and
- the clearance between the tools is negative.

Accordingly, Claim 17 and the claims dependent thereon are clearly patentable over Barnes. Further, similar to the above-cited prior art, it would not be obvious to a person of ordinary skill in the art to modify Barnes to reach the claimed method as Barnes does not have the same problems and does not relate to the same technical domain as the claimed method. Furthermore, Barnes does not disclose or suggest a negative clearance.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application and the present application is believed to be in condition for formal allowance. A notice of allowance is earnestly solicited.

Respectfully submitted,

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